Financing Constraint and Firm Investment Following a Financial Crisis in Indonesia

Agustinus Prasetyantoko

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Abstract

This paper deals with the sensitivity relation between firm-level investment and its internal liquidity by splitting samples into two different groups of firms, which are tradable (T) and non-tradable (N) sector. The study includes 226 listed companies in Jakarta Stock Exchange (JSX) by at least five consecutive years in the period of 1994 – 2004. This paper finds that during boom period, N-sector is less financially constrained, but in burst period, N-sector has greater financial constraints. It leads us to the explanation that during boom period N-sector grows faster than T-sector, but when crisis hits T-sector recovers more easily. By employing panel data analysis, our findings support an argument that asymmetric financing opportunities among N and T-sector are common in developing countries. Accordingly, this paper provides important explanations on firm-level investment behavior around financial crisis, which could be pivotal considerations in monetary and other relevant policies.

Key words: asymmetric financing opportunities, financing constraint, firm Investment, financial crisis

JEL Classification: D2, E51, G31

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1. Introduction

From academic point of view, the 1997 Asian crisis is a challenging "puzzle" inspiring series of research agenda in many fields of studies. Studies on both, theoretical and empirical perspectives are employed to understand this fashionable generation of crisis. Even though, research on it is still far from exhaustive since intricate problems intervene.

This paper proposes a piece of explanation centered on the micro evidence of the macro economic fragility rising from the asymmetric financing opportunities between tradable (T) and non-tradable (N) sector in Indonesia. For this issue, Tornell and Westermann (2002) have an interesting explanation as follows, "Many countries that have liberalized their financial markets, have witnessed the development of lending booms that sometimes ends in twin currency and banking crises and is followed by a protracted credit crunch that outlives a short-lived recession". Due to financial crisis, they identify two pivotal problems as main sources, namely risky currency mismatch and asymmetric financing opportunities across the T-sector and N-sector.

This paper deals with the latter issue, which is the asymmetric financing opportunity among T and N-sector at the onset and aftermath of crisis. Related to this issue, Tornell and Westermann (2002a, 200b, 2004) give further explanation of the coincidence of the credit market imperfections and asymmetric sector development as a common phenomenon in the middle income countries (MICs) that lead into financial fragility. For concerned countries, in the period of lending booms, that sometimes ends in currency and banking crisis, the N-sector grows faster that T-sector but inversely N-sector recovers slower than T-sector in the period of credit crunch following a financial crisis[1].

In line with this explanation, this paper has a fairly simple question: whether N-sector has more financial constraint than T-sector following a financial crisis in Indonesia. This question will be addressed by examining firm-level investment sensitivity with its internal liquidity or cash flows by grouping samples into two different parties[2]. The findings of this empirical study should be important in explaining the macro economic fragility, since firm-level investment is a pivotal variable in macro economic fluctuation.

[1] Important indication of the presence of credit crunch is the declining of the ratio of credit to GDP

[2] This study is inspired by Espanol (2005) employing the discrimination of tradable and non-tradable sector for analysing the Argentinean firms around financial crisis.

2. Financial Crisis and Firm Investment in Indonesia

Indonesia is a country undergoing a relatively slow economic recovery from depth and width of crisis. In 2004, compared with other countries in South East Asian region, real GDP growth in Indonesia was relatively lower: Indonesia had 4.9 % real GDP growth, meanwhile Thailand had 6.2 %, Philippines 6.0 % and Malaysia 7.1 %[3]. The data released by The World Bank shows that following the 1997 shock economic performance in Indonesia was weaker than average performance of East Asian countries. In Q-4 2001, Indonesian real GDP growth was 1.0 %, whereas average growth of East Asian countries was 4.3%.

After having high economic growth during over one decade, Indonesia faced great serious turbulence on economic performance[4]. The dismal performance of Indonesia's economy was started by the presence of extreme shock due to the 1997 financial crisis. Indonesia is a country suffering a deep crisis, where GDP growth reached minus (-) 13 % and inflation reached 58.5 % in the end of 1998. Meanwhile, to cope with the high currency depreciation, monetary authority in Indonesia (Bank Indonesia) hiked interest rate into 70.44 % on August 1998[5]. In such condition, there were no firms that can continue their activities normally. Approximately a half of Indonesian corporations became technically insolvent due to currency depreciation.

Theoretically, monetary authority is generally able to affect corporate sector through multiple channels. Bernanke and Gertler (1995) differentiate: *balance sheet channel* and *bank lending channel*. Balance sheet channel focus on the impact of the monetary policy on the borrowers' balance sheet through firm net worth, cash flow and liquid assets. Meanwhile bank lending channel describe the influence of monetary policy by the changing of the supply of loans channeled by banking institutions.

In emerging countries, bank credit plays a very important role in firm expansion, since capital market institutions are considerably underdeveloped. In this condition monetary policy

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[3] Data taken from *East Asia Update: Solid Growth, New Challenges*, published by The World Bank, March 2006, page 8. The average real GDP growth around 8 countries (Indonesia, Philippines, Malaysia, Thailand, Hong Kong, Korea, Singapore and Taiwan, China) quoted in this report is 6.6 %, which is higher from real GDP growth in Indonesia (4.9 %).

[4] In 1993, the World Bank considered Indonesia as one of the best performing countries in the world by about 7 % economic growth during several years. Indonesia is one of the East Asian Miracles. See World Bank Policy Research Reports titled "The East Asian Miracle: Economic Growth and Public Policy", Washington DC., 1993.

[5] On August 14th 1997, the monetary authority in Indonesia decided to adopt a free-floating exchange rate policy since the depreciation of Rupiah was very high. Indonesian Rupiah (IDR) depreciated sharply to United States Dollar (USD); from 4,950 IDR/1 USD in December 1997 to 15,000 IDR/1 USD in June 1998.

directly imposes corporate sector healthiness. By the high rate of interest, money supply from banking institution should decrease significantly. In such condition, corporate sector could not pay the interest rate. In the same time, due to financial difficulties corporate sector undergoes worse balance sheet due to the deteriorating of debt-equity ratio as well as internal liquidity.

In Indonesia, following financial crisis in 1997, corporate sector perform poorly, where investment level was very low. Instead of expanding their investment, firms prefer to consolidate their activities first. Following financial shock, the poor performance of firm-level investment was strongly impacted by tight money policy applied by Bank Indonesia dealing with exchange rate volatility[6]. However, it is not single factor influencing the gloomy condition.

In July 1999, due to the strengthening of economic condition, Bank Indonesia down-graded the interest rate into 13.8 % (see chart 1 in appendix). Generally, after July 1999 Indonesia can release from the period of crisis. It is due to that macro economic conditions were relatively stable, in term of inflation, exchange rate and interest rate. Nevertheless, the decrease of interest rate failed to support the real sector recovery. It seems that supply of credit from banking sector was not channeled into real sector. The question is whether it was caused by the inability of the real sector to absorb credit supply or rather the unwillingness of banking sectors to offer their credit.

In study conducted by Bank Indonesia, it was confirmed that credit crunch was present following a financial crisis in Indonesia[7]. Banking sector preferred to not offer their credit to firms sector to avoid the borrower risk-averse behavior. Theoretically, the lack of credit supply to firms sector could generate a second round effect on the business failures, which could also exacerbate the quality of bank loans. In such condition, there is a risk that the collapse of real sector could attack banking crisis in the second round. Hence, there is a complicated vicious circle which can not be easily resolved.

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[6] Tight money policy employed by Bank Indonesia become a central debate until nowadays, since this policy is required by International Monetary Fund (IMF) who has a fallacy in his policies in line with really happen in Asian countries in the mid of crisis. For this issue, see Iwan Jaya Azis, "What Would Have Happened in Indonesia if Different Economic Policies Had Been Implemented When the Crisis Started?", *Asian Economic Papers,* volume 1, Issue 2, Spring 2002. And also Iwan Jaya Azis, "Modelling Crisis Evolution and Counterfactual Policy Simulations: A Country Case Study", *ADB Institute Working Paper Series*, No.23, August 2001

[7] Bank Indonesia has conducted a research on the presence of credit crunch following financial crisis in Indonesia. For further information, the result of study is attached in the www.bi.go.id : "Credit Crunch In Indonesia in the Aftermath of the Crisis: Facts, Causes and Policy Implications" *Working Paper*, 2000, Directorate of Economic Research and Monetary Policy Bank Indonesia, prepared by team (Agung Juda, Bambang Kusmiarso, Bambang Pramono, Erwin G. Hutapea, Andry Prasmuko, Nugroho Joko Prastowo).

The soaring of interest rate following sharp depreciation of exchange rate in 1997 has caused the increase of firm debt equity ratio. High interest rate attacks the firms leverage. It means that the hike of interest rate influences directly the corporate value or firm net worth. Moreover, firm with weak financial condition tend to carry out financial consolidation first rather than employ business expansion. Meanwhile, firms Firm with bad balance sheet could not pay their maturity debt to the bank. In this moment, the deterioration of firm net worth induces directly to the balance sheet of banking sector.

Following a financial crisis, firms commonly prefer to reduce their activities by postponing their loan from banking sector. Instead of expansion, firms prefer to consolidate their internal activities in operation by reducing their internal liquidity and inventories rather than borrow from bank. In this case, demand for working capital credit diminishes significantly. Add up with the uncertainties in economic and business condition due to financial crisis, firms prefer to use their own capital rather that borrow from bank with high interest rate.

Bank Indonesia also finds that firms prefer to use their own fund (retained earnings) as the main source of the finance in the aftermath of crisis[8]. As amount of 56% from respondents in this survey use the retained earning, meanwhile 44% use the external fund of which the majority still originates from the bank credit, namely around 24% comprising 14% working capital credit and 10% investment credit. Others source of external financing are the capital market (6%), offshore loans (5%), bonds (3%), and their own group (1%)[9].

Balance sheet effect mechanism attacks simultaneously firm and banking sector. This mechanism commonly happens in country with weak corporate and banking sector, where third generation of crisis is present. In Mexico crisis has decreased GDP in the last three quarters of 1995 from 9.2% into -8% and 7%. However, Mexico had better chance than Indonesia since economic condition could be immediately recovered. In the second quarter of 1996, GDP growth grew at an average of above 5% until the first quarter of 1998[10].

In Mexico, asymmetric financing constraint was also present, where in post crisis period, tradable sector grow and recover easily, whereas non-tradable sector face stagnation

[8] Despite of the reluctant of banking sector to offer credit to the firm sector, the survey of Bank Indonesia for 120 firms concerning on the financing behavior following a financial crisis in Indonesia also confirm that firms sector is reluctant to access credit from banking sector.

[9] See Juda Agung *et al*. (2000).

[10] The comparison with neighbouring countries in East Asia and Latin America is addressed also in the study of Juda Agung *et al*. (2000)

following crisis and the presence of credit crunch. Although, some researches predict that usually tradable sector is able to get funding from the international market, but non-tradable sector must depend on own financing since bank is reluctant to provide credit for the latter sector[11].

3. Empirical Research

To deal with the question of which sector performs better (T or N) in before and post-crisis period, this paper employs the relatively rigorous equation measuring the sensitivity of the firm-level investment and its liquidity.

3.1. Investment equation

Since a seminal paper of Fazzari, Hubbard and Petersen/FHP (1988), the issue of financing constraints and firms investment have been popular debates among scholars[12]. FHP show that firms which are identified *a priori* as financially constrained have greater sensitivity in investment to the availability of internal finance in term of cash flow. In their proposition on financing constraint paradigm, they claim that the sensitivity of investment and liquidity is driven by the presence of the asymmetric information in capital market.

This argument is substantially different from neoclassical perspective on investment such as Modigliani and Miller/MM (1958) who promote the irrelevance of financial structure theory explaining that financial policy is not relevant for real investment decisions under certain conditions[13]. Oppositely, FHP propose the theoretical models of imperfections in capital market implying that external financing is more costly than internal financing for many firms. Since the degree of asymmetric information and agency costs depends on firm characteristics, certain firms may be more sensitive to financial factors than others. In other words, industrial or individual characteristics of the firms become important determinants of investment sensitivity to internal finance (cash flow).

Under the argument of FHP, investment should be significantly related to proxies for changes in net worth or internal fund. As in many previous studies, this paper uses the ratio

[11] This issue is still debatable. Espanol (2005), for example, provides empirical evidence that following a financial crisis in Argentine, tradable sector is more financially constrained than non-tradable sector.

[12] Different from MM, FHP assume that external finance is more expensive since the asymmetric information is presence.

[13] In their seminal paper, Theory of Capital Structure, published in 1958, MM describe that firm financial structure will not affect its market value in frictionless capital market. They assume that information is perfect in capital market.

of cash flow to the capital stock (CF/K) as the internal financing condition of the firms. A large body of research has found that the sensitivities of investment on its cash flow are higher for financially constrained firms (FHP, 1998; Chirinko and Kalckreuth, 2002).

To provide empirical evidence, this paper uses the basic equation originally developed by FHP (1988) as follows:

I = f(investment opportunities) + g(Internal funds)

or

(1)

$$\frac{I_{it}}{K_{it-1}} = f\left(\frac{X_{it}}{K_{it-1}}\right) + g\left(\frac{CF_{it}}{K_{it-1}}\right) + \upsilon_{it}$$

where I_{it} represents investment in fixed assets for firm i during period t, X represents a vector of variables, and u is an error term for i and t.

Following FHP (1988), the function g depends on the firm internal cash flow (CF), which represents the potential sensitivity of investment, to fluctuations in available internal finance, after investment opportunities are controlled for through the variables in X. All variables are divided by the capital stock in the beginning of period (K_{t-1}).

It is commonly applied the sensitivity of internal capital and investment into different characteristic of firm, such as low and high of dividend payout rate (Fazzari *et al*., 1998), Keiretsu or independent firms (Hoshi *et al*., 1991), bond rating (Whited, 1992), and tradable or non-tradable sector (Espanol, 2005). Since the interest of this research resides on the asymmetric sectoral development, this paper runs regression for different firm categories, which are Tradable (T) and Non-tradable (N) sector. This paper use fixed asset as a proxy of long-term investment. For capturing the sensitivity of T and N-sector, this paper employs the following equation (2)

(2)

$$\frac{I_{it}}{K_{it-1}} = \alpha_{cft}\left(\frac{CF_{it}}{K_{it-1}}\right)*T + \alpha_{cfn}\left(\frac{CF_{it}}{K_{it-1}}\right)*N + \alpha_q Q_{it} + \alpha_s\left(\frac{S_{it-1}}{K_{it-1}}\right) + \alpha_{wk}\left(\frac{\Delta WK_{it}}{K_{it-1}}\right) + \alpha_d\left(\frac{D_{it}}{K_{it-1}}\right) + \upsilon_{it}$$

where

K	=	Fixed-asset
I	=	Investment in long-term or gross investment ($K_t - K_{t-1}$)
CF	=	Cash Flow
Q	=	Tobin's Q
S	=	Total Sales
ΔWK	=	Change of Working Capital (Current Assets – Current Liabilities)
D	=	Total Debt
T	=	Tradable sector
N	=	Non-tradable sector

For robustness check, this paper employs several regression procedures. First, running estimation by excluding proxies of profitability and market value of the firms, which are lag of sales and Tobin Q.

(3)

$$\frac{I_{it}}{K_{it-1}} = \alpha_{cft}\left(\frac{CF_{it}}{K_{it-1}}\right) * T + \alpha_{cfn}\left(\frac{CF_{it}}{K_{it-1}}\right) * N + \alpha_{wk}\left(\frac{\Delta WK_{it}}{K_{it-1}}\right) + \alpha_d\left(\frac{D_{it}}{K_{it-1}}\right) + \upsilon_t$$

Other check of robustness is employed by considering the industrial sector effects. To do this, this paper uses equation where dummies of industrial sectors are introduced. By this equation, this paper focuses on the effects of industrial sector on the relation between firm investment and liquidity. For this purpose, this paper does not split sample on two different groups as be done in previous equation or equation (2), rather than applying dummies for each sector by equation (4) as follows:

(4)

$$\frac{I_{it}}{K_{it-1}} = \alpha_{cf}\left(\frac{CF_{it}}{K_{it-1}}\right) + \alpha_q Q_{it} + \alpha_s\left(\frac{S_{it-1}}{K_{it-1}}\right) + \alpha_{wk}\left(\frac{\Delta WK_{it}}{K_{it-1}}\right) + \alpha_d\left(\frac{D_{it}}{K_{it-1}}\right) + \eta_j + \varepsilon_{it}$$

Industrial sector dummies[14]

1. Sector A (basic industry) = agriculture (sector 1), mining (sector 2).
2. Sector B (manufacturing) = basic industry & chemical (sector 3), miscellaneous industry (sector 4), consumer good industry (sector 5)

[14] For sector dummies we use JASICA or Sectoral Index classification which is launched by Jakarta Stock Exchange authority on January 1996

3. Sector C (services) = property, real estate & building construction (sector 6), infrastructure, utilities & transportation (sector 7), trade, service & investment (sector 9)[15]

3.2 Variables

3.2.1. Dependent Variable

3.2.1.1. Investment

In common understanding, firm-level investment is the value of machinery, plants, and buildings that are bought by firms for production purposes. Accordingly, this paper use fixed-asset as proxy of investment in long-term period. Theoretical prediction considers that constrained firms should display a stronger sensitivity of investment to cash flow (FHP, 1998; Chirinko and Kalckreuth, 2002; Bruinshoofd, 2003). In this case, if MNC face larger financial constraints than firms from DC, it should be expected that α_{cfMNC} to be higher than α_{cfDC}.

3.2.2. Independent Variables

3.2.2.1 Cash-Flow

In Fazzari, Ferri and Greenberg (2003) we find that in the Keynesian endogenous investment model, if cash flow is insufficient to finance investment, firms take on debt. The implication is that investment activities should be financed primarily by internal finance. In this case, generally cash flow should be negatively related to firm investment.

Recently, a large body of literature suggesting that because of information asymmetries and capital market imperfections, corporate investment expenditure are significantly influenced by internal ability of firms to generate internal cash. It leads to the explanation that firm prefer first to the internal equity rather than external debt, so that investment should be negatively related to debt.

3.2.2.2 Tobin's Q

Tobin's Q is associated with firm's market capitalization reflecting the market anticipations of firm profitability investment opportunities. Tobin Q is measured by market value of assets deflated by book value of assets. In this paper, α_q is expected to be significant and positive.

[15] We exclude financial sector (sector 8) since financial statement of this sector is substantially different from other sector industries

3.2.2.3 Profitability

In this paper, sales in previous period are used for the proxy of profitability. In common sense, profitability will increase with investment. We expect that profitability will be significant and positive. Profitability is considered to explain the past and potential future performance of a firm. It is consistent with sales accelerator model; higher level of sales will enhance the production capacity in order to meet an enlarged demand (FHP, 1988)

3.2.2.4 Working Capital

Fazzari and Petersen (1993) describe that working capital is current assets (chiefly accounts receivable, inventories and cash) less current liabilities (primarily accounts payable and short-term debt), and it measures the firm's net position in liquid assets. Due to financial constraint, Fazzari and Petersen (1993) argue that it is costly for firms to change the level of fixed investment, and thus they will seek to maintain a stable fixed-investment path, over things equal by adjusting working capital. This argument is comparable with internal net works hypothesis (Bernanke and Gertler, 1989).

External finance, if available, may be more costly than internal finance because of transaction costs, agency problems, or asymmetric information. Thus, other thing equal, when firms choose to decrease (increase) working capital investment, fix investment should rise (fall).

In this case, α_{wk} is expected to be significant and negative.

3.2.2.5 Debt

There are two opposite theoretical analysis about the relation between firm's leverage and cash flow. Trade off theory suggests a positive relationship (Modigliani and Miller, 1958), while pecking order behavior implies a negative relationship (Myers and Majluf, 1984). Meanwhile, signaling theory suggests that a higher debt ratio can be considered as a signal of an improved capacity to finance investment, and hence the relation between debt and investment will be positive.

4. Results

4.1. Data set and Univariate Analysis

For this study, we include all non-financial firms listed in the Jakarta Stock Exchange (JSX) by using yearly accounting data provided by JSX's database and Indonesian Capital Market Directory (ICMD) provided by ECFIN, a private company. We have 298 samples of all non-financial firms listed in various different time period. In both data base, we do not find the variable of cash flow. Accordingly, we accessed directly to the annual report of each firms documented manually in JSX. In this case, we work manually to input data.

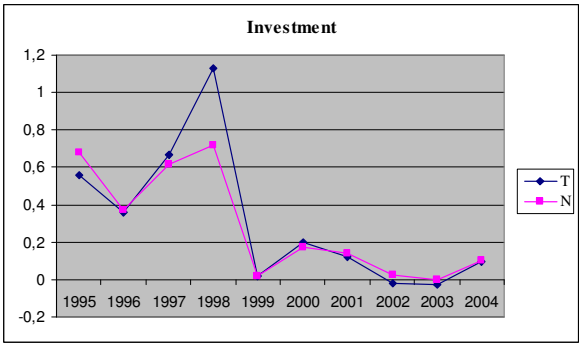
We sort data with at least 5 consecutive years and we find 234 firms. Furthermore, we exclude the outliers by sorting data from their median and standard deviation. We decide to exclude data with more than 10 percent of standard deviation. And finally, we have 226 firms for the period of 1994 – 2004. For classification of T and N-sector, we follow the JSX's category.

In graph 1, we can see how investment fluctuates during the period of study (1995 – 2004)[16]. We find that on the onset of crisis (1995 – 1996) both sector (T and N) were actually declining. They (both sectors) respond comparably the 1997 financial crisis, where the rate of investment has dropped drastically in the aftermath of crisis (1998 – 1999). From this graph, it is actually difficult to analyze which sector grew faster before crisis and sector recover quicker in the post crisis. The median of the investment rate among both sectors have comparable tendency.

For examining the different investment level between T and N sector, this paper employs two tests of variances, which are t-test for mean variance (t-statistic) and Wilcoxon rank-sum (Mann-Whitney) test for median variance (z-statistic). And we can seen in table 1 (in appendix) that there is no significant different of the firm-level investment between both sectors.

[16] This study use time lag variables for deflator, which is gross capital. Consequently, the time of study lessen one period due to the absence of deflator for last period (1994).

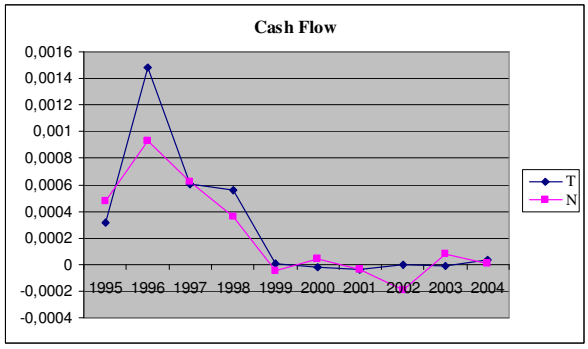
Graph 1. Median of Firm-level Investment over Capital Stock ($\frac{I_{it}}{K_{it-1}}$)



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Note: T is tradable sector, N is non-tradable sector

In term of cash flow volatility or firm liquidity such as described in graph 2, there are no significant differences between tradable and non-tradable sector. This observation is valid since tests of variance show there are no such significant differences between tradable and non-tradable sector in term of cash flow.

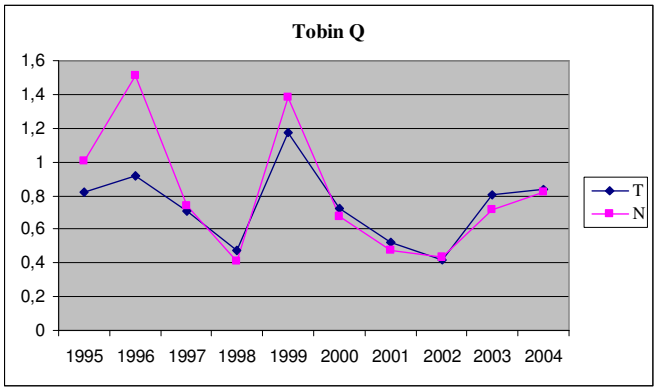
Graph 2. Median of Cash Flow over Capital Stock $\left(\frac{CF_{it}}{K_{it-1}}\right)$



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Note: T is tradable sector, N is non-tradable sector

Tobin Q as a proxy of firm opportunity is also not significant different in both sectors. The graph 3 shows a slight difference of Tobin Q in both sectors. However by the test of variance it is evident that the both sectors have no significant differences in Tobin Q. Tests of variance show that N sector has higher mean variance of Tobin Q in 0.2389 as well as higher median variance in 0.556. But both tests for t-statistic and z-statistic are not significant.

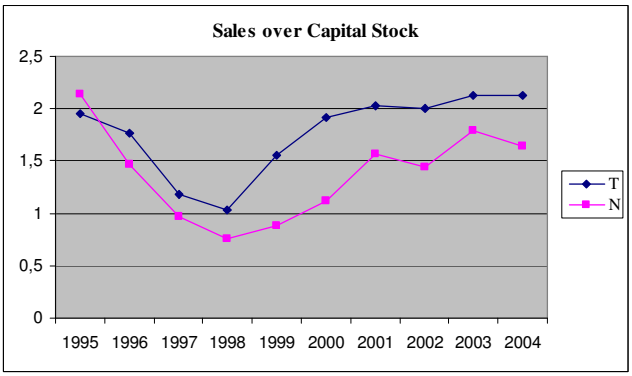
Graph 3. Median of Tobin Q



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Note: T is tradable sector, N is non-tradable sector

From the following graph (graph 4), it seems that T-sector has much higher level of sales. Test of variance also shows a significant difference in 1 percent for t-statistic and 5 percent for z-statistic. However, there is dubious evidence, since t-test which measure the difference with mean shows that N-sector has higher sales (6.406) meanwhile Wilcoxon rank-sum (Mann-Whitney) test inversely show that N-sector has smaller sales (62.091). It is showed that the variance of firm's sales is relatively high.

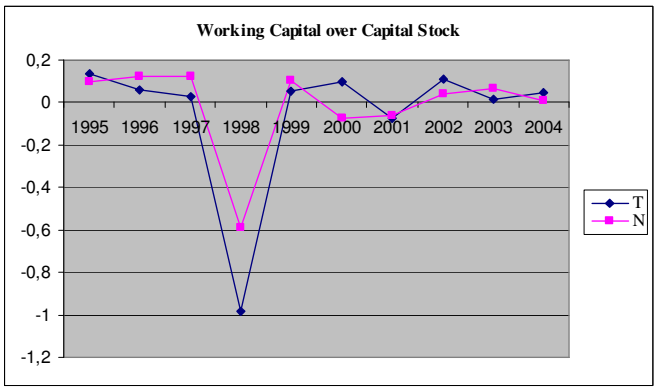
Graph 4. Median of Lag of Sales over Capital Stock $\left(\frac{S_{it-1}}{K_{it-1}}\right)$



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Note: T is tradable sector, N is non-tradable sector

In term of working capital, graph 5 shows how T and N-sector move comparably. And this evidence is supported by t-statistic and z-statistic, which show that there is no such significant difference in working capital between T and N-sectors.

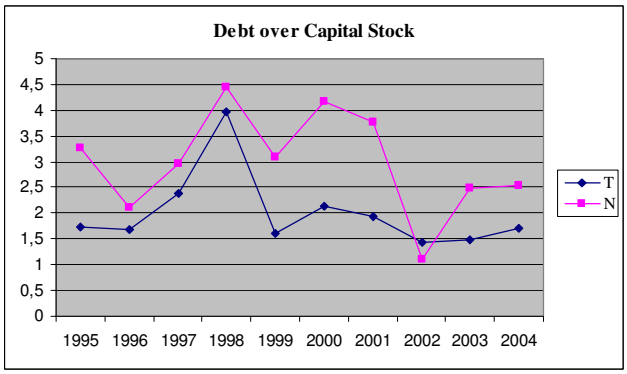
Graph 5. Median of Working Capital over Capital Stock $\left(\frac{\Delta WK_{it}}{K_{it-1}}\right)$



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Note: T is tradable sector, N is non-tradable sector

In term of debts, N-sector has much more higher than T-sector. Previous researches find that N-sector in South East Asian countries plays an important role in propagating financial debacle since most of them had revenues in local currencies but their leverages were in foreign currencies. By this research it seems that N-sector has a higher debt ratio as showed by test of variance, which are shown by t-stat in 10.08 and z-stat in 10.375 (both are significant in 1 percent).

Graph 6. Median of Total Debt over Capital Stock $\left(\frac{D_{it}}{K_{it-1}}\right)$



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Note: T is tradable sector, N is non-tradable sector

During the crisis (1997 – 1998) firms have a higher rate of debt due to currency depreciation. Data from Bank Indonesia shows that outstanding of investment credit

augmented during the crisis period even though interest rates have been increased[17]. It seems that most of firms failed to reschedule their debts and for avoiding the risk of bankruptcy, they had to own to external parties.

Many firms have been collapse. But they were not liquidated rather than were taken over by IBRA (Indonesian Banking Restructuring Agency) which has a main task to restructure banking sector by taking over firms with bad-debts. In table 7 (in appendix), we can see the 200 highest debtors under IBRA were dominated by services and manufacturing companies. It means that both sector (T and N), even they face the same shock, have comparable responses.

However, both sectors have significant different in profitability proxied by lag of sales and debt level. In the total period (1994 – 2005) N-sector has much higher level of debts. In term of profitability, N sector has higher than T sector (in t-stat) of profitability but less in median (z-stat) of profitability. It could be happened since N sector has higher standard deviation of profitability (8.883) measured by the lag of sales rather than T sector (4.576).

It can also be argued that N sector has higher heterogeneity of firms concerning firm profitability. Analysis of the sectoral behavior will be described bellow. But it should be important to note that by univariate and descriptive analysis, the behavior of T and N sector is not strikingly different even due to financial crisis.

4.2. *Multivariate Analysis*

4.2.1. Tradable and Non-tradable Sector Analysis

This research uses two famous methods of panel data analysis, namely fixed effect and random effect models. The fixed-coefficient model assumes that each company has different coefficients or that the variation of coefficients is correlated with the explanatory variables, meanwhile random-coefficient model assumes that, conditional on company-specific effects, the remaining slope coefficients are randomly distributed around a certain mean within each of these groups (Hsiao and Tahmiscioglu 1997). Hausman-test leads us to select the most appropriate estimation. The rejection of the Hausman-test indicates that the fixed effect model is better and therefore it must be chosen[18].

[17] See graph 1, 2, 3, 4 and 5 in appendix

[18] In this study, I use 5 percent of significant level as a measurement to reject null hypothesis. The result of the Hausman test is attached together with the result of regression in appendix

Fazzari, Hubbard and Petersen (1988) predict that firms, which have higher coefficient correlation in cash flow and investment, are firms, which have more financially constraints. In this research we can find (table 2 in appendix) that before crisis, the coefficient correlation of T-sector is (-10.038), but it is not significant. In this period, N-sector has –77.186 in 99 percent level of confidence. It means that T-sector has more financial constraint than N sector in the period of before crisis. But in post-crisis, N-sector has much higher coefficient correlation (28.772 in 1 percent of significant level > -22.009 not significant) of the firm-level investment and its liquidity, which lead us to understand that in post-crisis period N-sector was undermined much more severe in their financial constraint.

These findings are consistent with the argument on boom-burst of the sector development as predicted by Tornell and Wastermann (2002). They predict that in the period of boom, N-sector will develop faster rather than T-sector but in the burst period N-sector should be much more difficult to recover.

In this research we also find that Tobin Q is not effective for controlling the relation between investment and liquidity since the coefficient is not significant in all period of time (before and post-crisis, even in total period). Meanwhile, as presented in table 2 (in appendix), debt is very persistent in our estimation, since significant level for all period (total period, before and post-crisis) is relatively high (1 percent). Furthermore, the signs of the coefficient of total debt are always positive. It lead to the explanation that most firms use external financing for their activities. This piece of evidence is in line with trade-off theory predicting that financing choice is irrelevant in investment decision since capital market perfectly work so that firms can access external capital easily and without cost (Modigliani and Miller 1958, 1963).

In our case, coefficient of total debt to investment before crisis period is much higher (1.071) than coefficient in post-crisis period (0.120), both with 1 percent of significant level. It could indicate that before crisis firms in Indonesia were more exposed to the external debt, but in post-crisis period debts diminished. By the descriptive data mentioned before (graph 4 above), it is especially the case for N-sector.

Robustness check proceeded by employing estimation without lag of sales and Tobin Q support the main finding (table 3 in appendix), which in before crisis period T-sector has higher coefficient correlation with investment (-5.401 > -73.008). It means that liquidity is more important in T-sector or in other words T-sector is more financially constrained.

Meanwhile in post crisis period, N-sector has much higher coefficient (27.354 > -17.868). And hence, by excluding the expectation of firm profitability, the findings are robust that during boom period N-sector grows faster and in burst period T-sector easily recover.

4.2.2. Industrial Sectors Analysis

The main idea of this section is to capture the effect of industrial sector on the relation between investment and internal liquidity. This paper considers industrial sectors by the definition of JXS, which is divided into 9 sub-sectors[19]. The results of the effect of industrial sector dummies are attached in table 6 in appendix. We run regression by equation (4).

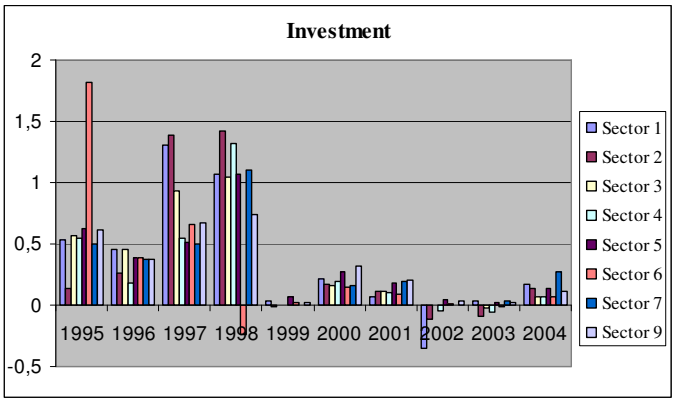
It is shown that sector 6 (property, real estate and building construction) has the highest coefficient correlation (101.125) on investment and cash flow. It means that for the case of sector 6, investment does not decrease with their internal liquidity. It seems that sector 6 use external financing to maintain their level of investment. This evidence is consistent with some investigations around financial crisis in South East Asia which give explanation on bubble economy[20].

Meanwhile, in the case of sector 7 (infrastructure, utilities and transportation) the coefficient correlation of investment and liquidity is very weak (-265.076) with high level of confidence (significant in 1 percent). It could be argued that firms in sector 7 use their internal liquidity to maintain their investment level. More investment means less cash flows.

By graphical observation it seems that sector 6 has high investment volatility. Generally, due to the 1997 currency depreciation the investment level of firms in sector 6 diminishes significantly.

[19] See JASICA classification as mentioned above
[20] See for example Paul Krugman (1998) "What happened to Asia?" *mimeo*, MIT

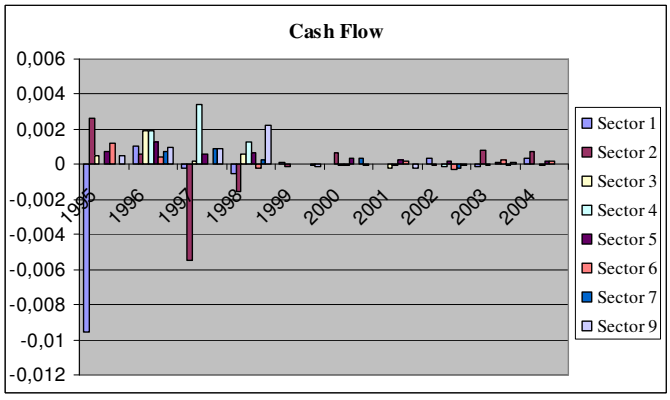
Graph 7. Median of Investment over Capital Stock



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Sector 1 = agriculture
Sector 2 = mining
Sector 3 = basic industry & chemical
Sector 4 = miscellaneous industry
Sector 5 = consumer good industry
Sector 6 = property, real estate & building construction
Sector 7 = infrastructure, utilities & transportation
Sector 9 = trade, service & investment

Meanwhile, by observing graph 8 below, it seems that due to currency depreciation firms in sector 2 (mining) decrease significantly their cash flow. Firms in sector 4 (miscellaneous industry), which include industries such as machinery and heavy equipment, automotive and components, cable and electronics, have high level of cash flow.

Graph 8. Median of Cash Flow over Capital Stock

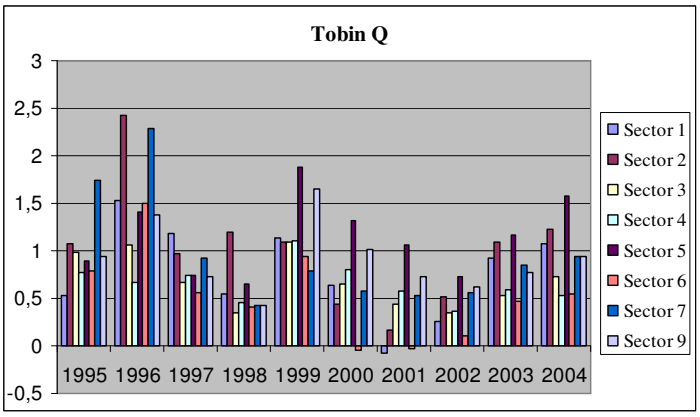


Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Sector 1 = agriculture
Sector 2 = mining
Sector 3 = basic industry & chemical
Sector 4 = miscellaneous industry
Sector 5 = consumer good industry
Sector 6 = property, real estate & building construction

Sector 7 = infrastructure, utilities & transportation
Sector 9 = trade, service & investment

In graph 9 below, we can see that firms in sector 5 (consumer good) have relatively high market expectation. It seems that firms in sector 5 have high performance in the capital market.

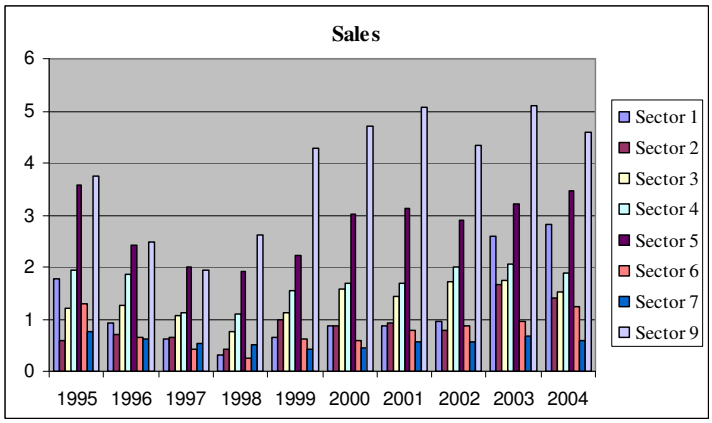
Graph 9. Median of Tobin Q



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Sector 1 = agriculture
Sector 2 = mining
Sector 3 = basic industry & chemical
Sector 4 = miscellaneous industry
Sector 5 = consumer good industry
Sector 6 = property, real estate & building construction
Sector 7 = infrastructure, utilities & transportation
Sector 9 = trade, service & investment

By data descriptive below (graph 10), we find that sector 9 (trade, service and investment) gain most profitable revenue. Currency crisis does not reduce the sales of the firms in sector 9. This evidence can not easily be described. It need further research to clarify this sign.

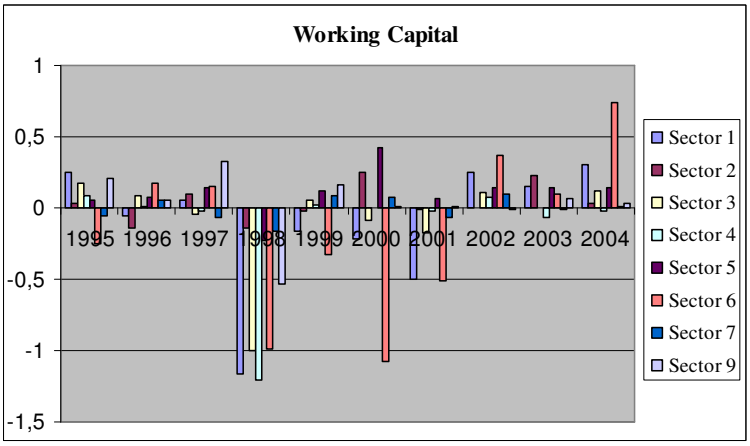
Graph 10. Median of Lag of Sales over Capital Stock



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Sector 1 = agriculture
Sector 2 = mining
Sector 3 = basic industry & chemical
Sector 4 = miscellaneous industry
Sector 5 = consumer good industry
Sector 6 = property, real estate & building construction
Sector 7 = infrastructure, utilities & transportation
Sector 9 = trade, service & investment

In term of working capital, in the aftermath of crisis, firms in sector agriculture have least ratio of working capital to capital stock. It means that for supporting their activities in the same level they did not need employing more working capital, since their revenues can cover the needs of their activities.

Graph 11. Median of Working Capital over Capital Stock

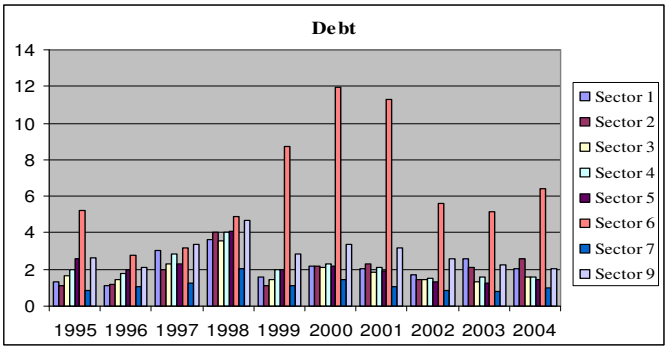


Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Sector 1 = agriculture
Sector 2 = mining
Sector 3 = basic industry & chemical
Sector 4 = miscellaneous industry
Sector 5 = consumer good industry
Sector 6 = property, real estate & building construction

Sector 7 = infrastructure, utilities & transportation
Sector 9 = trade, service & investment

In the following graph (graph 12), it is important to note that property sector has a high ratio of debt which could be risky. Property sector is basically an unproductive sector. This descriptive data support the regression result due to the role of property sector (non-tradable sector) in risk to exacerbate crisis in Indonesia.

Graph 12. Median of Total Debt over Capital Stock



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Sector 1 = agriculture
Sector 2 = mining
Sector 3 = basic industry & chemical
Sector 4 = miscellaneous industry
Sector 5 = consumer good industry
Sector 6 = property, real estate & building construction
Sector 7 = infrastructure, utilities & transportation
Sector 9 = trade, service & investment

Data from Bank Indonesia as shown in graph 5 in appendix describes how non-tradable sector actually have been more exposed to foreign debts. Data of investment credit outstanding of commercial banks in foreign currency shows that before crisis, the flux of foreign debt among tradable and non-tradable sector happened in inverse. Before crisis T-sector has had more foreign debt but in post crisis period N-sector exceeded.

5. Conclusion

The main finding of this paper is that during boom period, T-sector has greater coefficient correlation on the relation between investment and its internal liquidity. Oppositely, during burst period, N-sector has much greater on the relation. It means that T-sector is more financially constrained during boom period, but during burst period N-sector has greater financial constraint. These evidences lead us to the understanding that during

boom period N-sector increases faster than T-sector, but during burst period, inversely T-sector grows faster.

By employing the innovation of FHP (1988) on the sensitivity of firm-level investment and its internal liquidity, this paper supports the argument that there is an asymmetric financing opportunities between T and N-sector undermining financial fragility, such as described by Tornell and Wastermann (2002). On top of that, by qualitative observation, we can infer that both sector (T and N) react comparably when the financial crisis is present. However, in term of firm profitability and debts, there are great different responses among firms in T and N-sector. Both variables should be pertinent indicators for financing policies and performance of the firms.

Furthermore, by employing industrial sector dummies, we find that sector 6 in our sample (sector property, real estate & building construction) has a highest positive correlation with investment. In this sector, cash flow increases with investment: the higher investment level is the bigger internal liquidity. It leads us to the understanding that investment is not financed by internal sources, but by external ones. Accordingly, we can predict that sector 6 should be the most leveraged firm in Indonesia. This evidence seems to be consistent with the thesis of Asian bubble as proposed by Krugman (1998) for example, who explains that excessive debt in property sector becomes one of the most important factors propagating Asian crisis.

And hence, this research provides two pieces of evidence that could be important for further the research on the field of firm behavior in Indonesia. First, N-sector develops faster in boom period but it is more difficult to recover when the crisis hit. This finding is showed by the empirical evidence that T sector has higher sensitivity on liquidity and investment in before crisis period (1994 – 1996) but N-sector has much higher in post-crisis period (1998 – 2004).

Second, generally firms in Indonesia still prefer external debt for financing their investment activities, even in post crisis period. In this case, it supports our understanding that capital structure of the firms in Indonesia is actually prone to financial fragility that could easily lead to the financial crisis.

However, this research has important limitation in line with the data availability, which is poorly constructed. The solution of the lack of several variables of data is covered by manual works. It is the case for data of cash flow variable. This could be important limitation

in two senses. First, poor availability of data lead limited analysis, and second, efforts to provide data by manual works could contain serious errors, which are commonly present in the manual works.

Other important problem in this research is the high volatility of data. To deal with this problem, we exclude many companies which contain volatile data in certain variables. And as the consequence, the number of firms examined in this research drop significantly.

For further research, this paper needs improvement on econometrical methods for gaining more rigorous results. The general theme of this paper is important for further studies on investment behavior in Indonesia. The asymmetric financing opportunities between different groups of the firms could be interesting to be investigated for gaining better understanding on firm behavior concerning on the financial fragility and economic vulnerability in Indonesia. In the future research, it should be interesting to develop asymmetric financing opportunities between different group, such as family and non-family firms, bank and non-bank relation, MNC and DC, etc.

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Appendix

Tabel 1. Regression of Univariate

		Mean	Median	Stand Dev.	Maximum	Minimum	*t-stat*		*z-stat*	
Investment over Capital Stock	All	0.700	0.180	4.663	5.292	-0.649	0.846		-0.48	
	T sector	0.637	0.181	3.702	4.243	-0.577				
	N sector	0.815	0.178	6.010	7.248	-0.700				
Cash Flow over Capital Stock	All	0.002	0.000	0.045	0.050	-0.026	0.377		-0.179	
	T sector	0.002	0.000	0.048	0.044	-0.019				
	N sector	0.002	0.000	0.038	0.080	-0.042				
Tobin Q	All	1.349	0.738	8.624	12.891	-6.510	0.239		0.556	
	T sector	1.315	0.731	8.591	12.101	-7.762				
	N sector	1.410	0.764	8.690	13.566	-5.674				
Lag of Sales over Capital Stock	All	3.501	1.612	6.523	34.913	0.087	6.406	***	-2.091	**
	T sector	2.828	1.699	4.576	16.560	0.146				
	N sector	4.701	1.376	8.883	43.578	0.062				
Working Capital over Capital Stock	All	0.052	0.036	5.965	9.136	-10.381	0.248		-0.457	
	T sector	-0.060	0.039	2.228	4.342	-6.460				
	N sector	0.254	0.034	9.547	17.374	-16.306				
Total Debt over Capital Stock	All	4.796	2.159	10.105	51.984	0.255	10.08	***	10.375	***
	T sector	3.182	1.943	5.831	24.097	0.286				
	N sector	7.680	3.060	14.526	71.436	0.235				

T-test for mean variance and Wilcoxon rank-sum (Mann-Whitney) test for median variance, ***, ** significant in 1 and 5 percent respectively

Table 2. Regression of the Sensitivity of T and N sectors

	Total Period (1994 - 2004)		*Before Crisis (1994 - 1996)*		*During Crisis (1997 - 1998)*		*After Crisis (1999-2004)*	
Intercept	-2.192	***	-1.949	***	0.901	*	-0.266	***
	(0.163)		(0.753)		(0.463)		(0.059)	
Cash Flow over CS for T sector	6.689		-10.038		-0.181		-22.009	
	(8.942)		(22.966)		(3.338)		(14.132)	
Cash Flow over CS fo N sector	-114.384	***	-77.186	***	5.298		28.772	***
	(13.705)		(10.519)		(14.496)		(10.641)	
Tobin Q	-0.001		-0.019		0.014		-0.013	
	(0.043)		(0.334)		(0.026)		(0.012)	
Lag of Sales over CS	-0.091	***	-0.219		0.162		-0.017	***
	(0.024)		(0.261)		(0.149)		(0.006)	
ΔWorking Capital over CS	-0.018		-0.044		-0.013		0.019	
	(0.053)		(0.230)		(0.058)		(0.015)	
Total Debt over CS	0.696	***	1.071	***	0.054		0.120	***
	(0.029)		(0.102)		(0.045)		(0.012)	
Number of Obs	1990		325		392		1273	
R^2 – Adjusted	0.6985		0.9917		0.1281		0.2495	
X^2 - Hausman Test	532.76		120.67		29.11		76.33	
Prob - X^2	0.0000		0.0000		0.0001		0.0000	
Specification	FE		FE		FE		FE	

FE is Fixed Effect. *, **, ***, denote significance at the, 10 percent, 5 percent and
1 percent levels, respectively. Standard deviation is reported in parentheses for specifications

Table 3. Regression without Tobin Q and Sales

	Total Period (1994 - 2004)		*Before Crisis (1994 - 1996)*		*During Crisis (1997 - 1998)*		*After Crisis (1999-2004)*	
Intercept	-0.527	***	-2.503	***	1.356	***	-0.258	***
	(0.106)		(0.266)		(0.188)		(0.057)	
Cash Flow over CS for T sector	2.499		-5.401		1.284		-17.868	
	(2.213)		(18.925)		(2.872)		(14.214)	
Cash Flow over CS fo N sector	21.166	***	-73.008	***	4.730		27.354	***
	(4.445)		(9.131)		(13.495)		(10.734)	
ΔWorking Capital over CS	-0.364	***	-0.166		-0.030		0.014	
	(0.016)		(0.140)		(0.050)		(0.015)	
Total Debt over CS	0.251	***	1.010	***	0.035		0.100	***
	(0.009)		(0.054)		(0.038)		(0.011)	
Number of Obs	2037		358		399		1280	
R^2 – Adjusted	0.6746		0.9913		0.1060		0.2161	
X^2 - Hausman Test	489.67		101.09		74.38		53.66	
Prob - X^2	0.0000		0.0000		0.0000		0.0000	
Specification	FE		FE	FE	FE		FE	

FE is Fixed Effects. *, **, ***, denote significance at the, 10 percent, 5 percent and 1 percent levels, respectively. Standard deviation is reported in parentheses for specifications

Table 4. Regression without Tobin Q

	Total Period (1994 - 2004)		*Before Crisis (1994 - 1996)*		*During Crisis (1997 – 1998)*		*After Crisis (1999-2004)*	
Intercept	-2.065	***	-2.067	***	0.462		-0.241	***
	(0.154)		(0.492)		(0.395)		(0.057)	
Cash Flow over CS for T sector	8.939		-12.599		4.123		-21.624	
	(8.974)		(20.106)		(3.456)		(14.231)	
Cash Flow over CS fo N sector	-114.882	***	-76.827	***	13.926		29.715	***
	(13.793)		(9.818)		(11.370)		(10.724)	
Lag of Sales over CS	-0.074	***	-0.253		-0.151	**	-0.014	**
	(0.024)		(0.241)		(0.065)		(0.006)	
ΔWorking Capital over CS	-0.066		-0.009		-0.266	***	0.017	
	(0.051)		(0.204)		(0.055)		(0.015)	
Total Debt over CS	0.655	***	1.087	***	0.203	***	0.108	***
	(0.028)		(0.091)		(0.036)		(0.012)	
Number of Obs	2037		358		399		1280	
R^2 – Adjusted	0.6799		0.9915		0.0975		0.2275	
X^2 - Hausman Test	493.85		139.58		8.52		66.29	
Prob - X^2	0.0000		0.0000		0.1296		0.0000	
Specification	FE		FE		RE		FE	

FE is Fixed Effects and RE is Random Effects. *, **, ***, denote significance at the, 10 percent, 5 percent and 1 percent levels, respectively. Standard deviation is reported in parentheses for specifications

Table 5. Regression of T and N sectors (partially)

	Total Period (1994 - 2004)		*Before Crisis (1994 - 1996)*		*During Crisis (1997 - 1998)*		*Post Crisis (1999 - 2004)*	
	T sector	N sector	T sector	N sector	T sector	N sector	T sector	N sector
Intercept	-1.557 ***	-2.232 ***	-1.427 **	1.559	1.125 ***	0.578	-0.439 ***	0.145
	(0.136)	(0.428)	(0.569)	(2.623)	(0.431)	(1.615)	(0.052)	(0.105)
Cash Flow	3.131	-159.446 ***	-4.666	-57.001 ***	0.718	4.215	-36.945 ***	11.935 ***
	(7.565)	(16.303)	(15.816)	(18.424)	(3.718)	(16.071)	(12.187)	(2.943)
Tobin Q	0.008	-0.007	0.179	-0.616	0.018	-0.057	-0.018	0.004
	(0.040)	(0.107)	(0.270)	(0.811)	(0.028)	(0.186)	(0.012)	(0.012)
Lag of Sales over CS	-0.162 ***	0.027	-0.092	-0.734	0.056	0.239	-0.054 ***	0.009 ***
	(0.026)	(0.042)	(0.219)	(0.594)	(0.210)	(0.311)	(0.007)	(0.007)
ΔWorking Capital over CS	-0.034	0.104	-0.250	-1.459 *	-0.015	-0.012	0.131 ***	-0.027
	(0.074)	(0.075)	(0.217)	(0.836)	(0.072)	(0.124)	(0.027)	(0.010)
Total Debt over CS	0.818 ***	0.441 ***	0.973 ***	0.936 ***	0.059	0.068	0.285 ***	0.016 ***
	(0.037)	(0.048)	(0.096)	(0.233)	(0.064)	(0.078)	(0.018)	(0.006)
Number of Obs	1273	717	205	120	251	141	817	456
R^2 - Adjusted	0.7902	0.6480	0.9965	0.9882	0.1262	0.1769	0.5372	0.0525
X^2 - Hausman Test	-	235.94	24.32	94.23	58.89	974.52	210.73	10.92
Prob - X^2	-	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0530
Specification	FE	FE	FE	FE	FE	FE	FE	RE

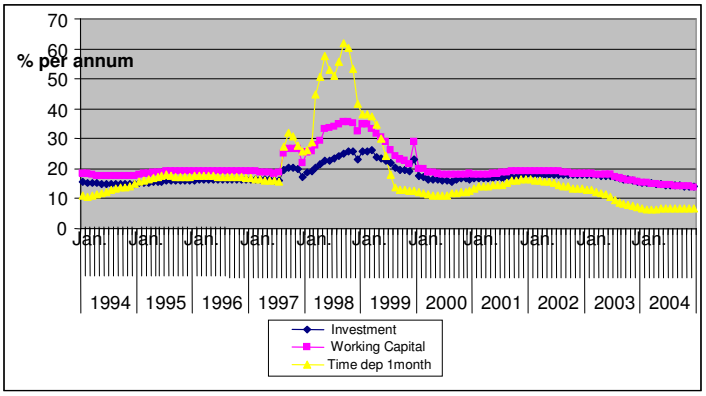
FE is Fixed Effect and RE is Random Effect. *, **, ***, denote significance at the, 10 percent, 5 percent and 1 percent levels, respectively.
Standard deviation is reported in parentheses for specifications

Table 6. Regression for Industrial sector

	Sector 1	*Sector 2*	*Sector 3*	*Sector 4*	*Sector 5*	*Sector 6*	*Sector 7*	*Sector 9*
Intercept	-0.285	0.110	0.298***	-2.574	-0.563**	-1.495**	-1.143	0.343**
	(0.175)	(0.552)	(0.092)	(1.745)	(0.253)	(0.649)	(1.860)	(0.147)
Cash Flow over CS	-50.096	-14.098	2.738	69.860	-19.282**	101.125***	-265.076***	3.209
	(48.590)	(27.393)	(2.070)	(72.861)	(8.825)	(21.767)	(40.998)	(6.834)
Tobin Q	0.063***	0.010	0.037	-0.004	0.019	0.019	0.878	-0.072
	(0.021)	(0.040)	(0.047)	(0.094)	(0.025)	(0.047)	(1.320)	(0.049)
Lag of Sales over CS	0.341***	-0.119	-0.032***	-0.816***	0.035	0.667**	-0.073	-0.009
	(0.077)	(0.392)	(0.011)	(0.302)	(0.039)	(0.265)	(1.351)	(0.009)
ΔWorking Capital over CS	-0.034	-0.334***	-0.032	0.301*	0.167***	-0.110*	-0.208	0.041
	(0.045)	(0.163)	(0.033)	(0.185)	(0.059)	(0.062)	(0.353)	(0.030)
Total Debt over CS	0.003	0.266***	0.110***	1.086***	0.345***	0.023	0.374	0.070***
	(0.032)	(0.053)	(0.032)	(0.093)	(0.058)	(0.037)	(0.342)	(0.026)
Number of Obs	54	63	447	400	325	196	121	399
R^2 – Adjusted	0.5775	0.8385	0.1311	0.8938	0.3498	0.5977	0.9232	0.0991

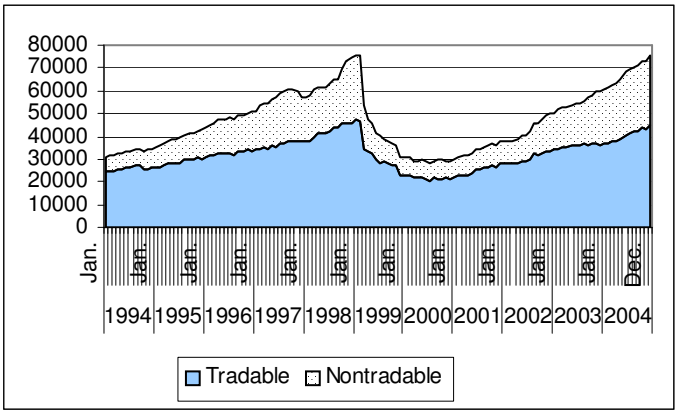
*, **, ***, denote significance at the, 10 percent, 5 percent and 1 percent levels, respectively.
Standard deviation is reported in parentheses for specifications

Graph 1. Interest Rate of Commercial Banks (monthly data)



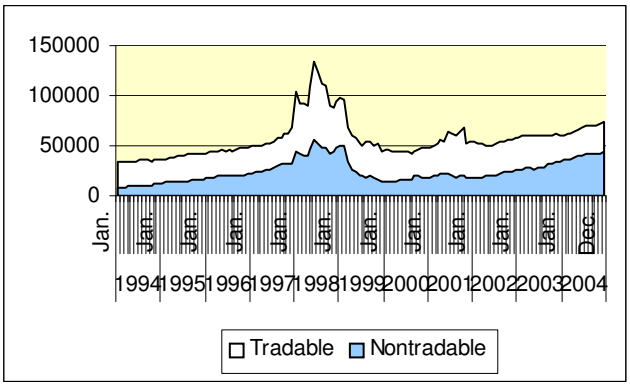
Source: based on data from Indonesian Central Bank, Bank Indonesia (www.bi.go.id)

Graph 2. Outstanding of Investment Credit of Commercial Banks in Local Currency (in Billion of Rupiah)



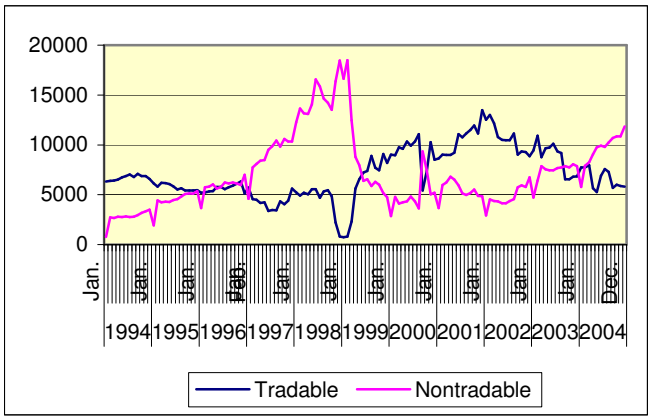
Source: Bank Indonesia, author's calculation

Graph 3. Outstanding of Investment Credit of Commercial Banks in Local & Foreign Currency (in Billion of Rupiah)



Source: author's calculation based on data from Indonesian Central Bank, Bank Indonesia

Graph 5. Outstanding of Investment Credit of Commercial Banks in Foreign Currency (in Billion of Rupiah)



Source: author's calculation based on data from Indonesian Central Bank, Bank Indonesia

Table 7. Profile of 200 greatest debtors under IBRA (Indonesian Banking Restructuring Agency)

	Non-tradable Sector		**Tradable Sector**
	Service		***Manufacturing***
1	ABS Industry Indonesia PT	1	Adikara Nirmala PT
2	Alfa Goldland Realty PT	2	Andatu Lestari Plywood PT
3	Authotrans Perkasa Indonesia PT	3	Apac Inti Corpora PT
4	Bahana Bina Ventura PT	4	Artika Optima Inti PT
5	Bahana Investa Argha PT	5	Asriland PT
6	Bahana Pembina Usaha Ina.	6	Bakrie&Brothers PT
7	Bakrie International Finance	7	Bante Java Persada, PT
8	Bakrie Investindo PT	8	Batasan PT
9	Bekasi Fajar Industrial Estate, PT	9	Bentoel Prim, PT
10	Bentala Lestari, PT	10	Bhirawa Steel, PT
11	Bentala Mahaya, PT	11	Bimantara Citra, PT
12	BNI Securities, PT	12	Buanagraha Artha Prima, PT
13	Boga Nandini Andrawina, PT	13	Budiono Widodo
14	Bonauli Realestate, PT	14	Bukti Jonggol Asri, PT
15	Bunas Finance Indonesia TBK, PT	15	Bukit Welirang Indah, PT
16	Citra Marga Finance BV	16	Bumi Angkasa Textile Indonesia, PT
17	Danamon Finance, PT	17	Chandra Asri, PT
18	Danareksa, PT	18	Cisadane Raya Chemicals, PT
19	Datakom Asia, PT	19	Daya Besar Agung, PT
20	Deemte Sakti International	20	Detta Marina, PT
21	Dhamala Intiutama Int'l BV. PT	21	Dok & Perkapalan Kodja Bahari, PT
22	Dharmala Sakti Sejahtera, PT	22	Ekadharma Garmentama, PT
23	Duta Anggada Realty, PT	23	Fajar Surya Perkasa, PT
24	Eastglobe LTD	24	Frans Putratex PT
25	Estika Yasakelola, PT	25	Gema Lapik PT
26	Global Toserco LTD	26	Gemala Industrie, LTD
27	Graha Sarana Pratama PT (Suryapaloh)	27	Griri Asih Indah, PT
28	Indomas Pacific Permai, PT	28	Giri Asih Jaya PT
29	Indopac Finance	29	Gunawan Textindo PT

30 Inti Karsa Daksa, PT
31 Jababeka Interantional BV
32 Kondowana Safari PT
33 Mandara Permai PT
34 Metropolitant Land PT
35 Modernland Realty TBK PT
36 Multi Angsana Ganda PT
37 Nelson Investment INT, LTD
38 Ometraco Multi Artha PT
39 Pasific Interantional Finance PT
40 Primaswadana Perkasa Finance PT
41 Putra Surya Multidana TBK, PT
42 Putra Surya Perkasa TBK, PT
43 Risjad Brasali Styrindo PT
44 Risjadson PT
45 Salindo Perdana F. PT
46 Sanggraha Dhika PT
47 Segitiga Atrium, PT
48 Segitiga Plaza Hotel, PT
49 Sewu Agro Investama PT
50 Sinar Slipi Sejahtera PT
51 Sumbermitra Sarana Realtindo PT
52 Surya Citra Televisi Indonesia PT
53 Tirtamas Majutama PT
54 Welwin Finance, Hongkong

Trade/Hotel/Restaurant

1 Aneka Agroprasidha PT
2 Aneka Bumi Prasidha PT
3 Bakrie Nirwana Resort PT
4 Banigati Betegak, PT
5 Bina Perkasa Indograha, PT
6 Caterison Sukses, PT
7 Citra Rapi Hotel, PT
8 Citrasarana Graharealty Corp.
9 Dewata Agung Wibawa
10 Dharma Niaga (Persero), PT
11 Dharmala Sakti Pancagraha
12 Griya Permata Lestari
13 Humpuss PT
14 Humpuss Terminal P, PT
15 Mandiri Citrasejati Hotel PT
16 Mas Murni IND, PT
17 Moeladi PT
18 Mulia Intan Lestari, PT
19 Pengembangan Pariwisata Lombok PT
20 Permadani Khatulistiwa Nusantara PT
21 Prabu Budi Mulia PT
22 Ramasari Surya Persada PT
23 Sentra Sintetika Jaya
24 Sinn Bualuang Public Company LTD
25 Staco Graha PT

30 Hargas Industries IND PT
31 Hartono Istana Electronics PT
32 Industri Galvanealmas, PT
33 Intear Pretindo Inti Citra, PT
34 Interworld Steel Mills Indonesia, PT
35 Inti Texturindo Raya, PT
36 IPTN
37 Jakarta Cakra Tunggal Steel Mills PT
38 Jakarta Kyoei Steel
39 Jindo Kordeco Heavy IND, PT
40 Kalhold Utama, PT
41 Kalimanis Plywood IND, PT
42 Karawang Utama, PT
43 Kertas Basuki Rachmat PT
44 Kertas Leces PT
45 Kiani Kertas PT
46 Komunikasi Selular Indonesia PT
47 Langgeng Makmur I TBK, PT
48 Lucky Star Navigation Corp.
49 Mahliagai Senantiasa Makmur
50 Maligi Spinning Mills
51 Mitra Laras Serasi PT
52 Multi Strada Arah Sarana, PT
53 Multikarsa Investama, PT
54 Nasio Dutamitra Electric PT
55 Nusantara Playwood PT
56 Omedata Electronics, PT
57 Palwa Minatama Jaladri PT
58 Pancashindu Abadi PT
59 Pangaji Mario Refconindo PT
60 Panggung Electric Corp PT
61 Papyrus Sakti PT
62 Poyfin Canggih PT
63 Polyprima Karyareksa PT
64 Prajogo Pangestu
65 Samless Pipe Indonesia Jaya PT
66 Sebasli Pratama
67 Semen Baturaja, PT
68 Semen Cibinong, PT
69 Semen Gombong PT
70 Serindo Djaja Marmer Industries, PT
71 Sipatex Putri Lestari PT
72 Sragen Abadi Tekstil PT
73 Staco Arta Karya PT
74 Telekomindo Primabhakti PT
75 Tensindo Sejati PT
76 Terang Kita PT
77 The First National Glassware PT
78 Timor Putra Nasional PT
79 Usaha Gedung Bimantara PT
80 Wahana Perkasa Auto Jaya PT
81 Yason Pernana PT

26 Swastika Hijau Makmur
27 Tahta Medan PT
28 Tirtamas Comexindo PT

Transportation/Warehouse/Telecomunication

1 Asia Cellular Sattellite PT
2 Badiradaya Sentranusa PT
3 Merpati Nusantara PT
4 Pasifik Satelit Nusantara PT
5 Satelindo PT
6 Sempati Air PT
7 Widya Duta Informindo, PT

Construction

1 Batanghari Persada, PT
2 Bukit Sentul TBK, PT
3 Hutama Karya, PT
4 Karyagraha Elektrindo PT
5 Lippo Karawaci TBK, PT
6 Marga Nurindo Bhakti PT
7 Margabumi Matraraya PT
8 Samurindo Swadaya Sejatera AP
9 Swadharma Primautama PT
10 Swaraeka Prasetia PT
11 Istaka Karya PT

NN

1 Ceka Jawa Industri, PT
2 Indobuildco, PT
3 Internusa Keramik, PT
4 Inti Keramik Alamsri, PT
6 Risjad Brasali Peroxid
82 Continental Sinar Steel PT
83 Sandatex PT

Agribusiness

1 Arindo Tri Sejahtera
2 Bali Raya PT
3 Central Pertiwi Bahari, PT
4 Gerak Maju PT
5 Hasil Cipta Laut PT
6 Ikq Muda Seafood International, PT
7 Kiani Lestari PT
8 Nusantara Ampera Bakti PT
9 Riau Andalan Kertas PT
10 Riau Prima Energi PT
11 Tuwung Agung PT

Mining

1 Humpuss, INC

Source: *Annual Report 2000*, Indonesian Banking Restructuring Agency (IBRA)